NAVAL POSTGRADUATE SCHOOL

Monterey, California

THESIS

PROCEDURES FOR ACQUISITION OF MAJOR SYSTEMS
FOR
THE PAKISTAN NAVY

by

Waqar Siddiq

December, 1989

Thesis Advisor: Raymond W. Smith

Unclassified
SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No 0704-0188

1a REPORT SECURITY CLASSIFICATION: Unclassified	1b RESTRICTIVE MARKINGS
2a SECURITY CLASSIFICATION AUTHORITY	3 DISTRIBUTION / AVAILABILITY OF REPORT
2b DECLASSIFICATION / DOWNGRADING SCHEDULE	
4 PERFORMING ORGANIZATION REPORT NUMBER(S)	5 MONITORING ORGANIZATION REPORT NUMBER(S)
6a NAME OF PERFORMING ORGANIZATION: Naval Postgraduate School; 6b OFFICE SYMBOL (If applicable): 54	7a NAME OF MONITORING ORGANIZATION: Naval Postgraduate School
6c ADDRESS (City, State, and ZIP Code): Monterey CA 93943	7b ADDRESS (City, State, and ZIP Code): Monterey CA 93943
8a NAME OF FUNDING / SPONSORING ORGANIZATION; 8b OFFICE SYMBOL (If applicable)	9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c ADDRESS (City, State, and ZIP Code)	10 SOURCE OF FUNDING NUMBERS: PROGRAM ELEMENT NO; PROJECT NO; TASK NO; WORK UNIT ACCESSION NO

11 TITLE (Include Security Classification)
Procedure for Acquisition of Major Systems for the Pakistan Navy.

12 PERSONAL AUTHOR(S) Waqar Siddiq

13a TYPE OF REPORT	13b TIME COVERED	14 DATE OF REPORT (Year, Month, Day)	15 PAGE COUNT
Masters Thesis	FROM _____ TO _____	December 1989	75

16 SUPPLEMENTARY NOTATION The views expressed in this thesis are those of the author and do not relect the offical policy or position of the Dept. of Defense or the U.S. Government

17 COSATI CODES			18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Acquisition strategy, Source selection plan, Theses. (SDN)

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

This thesis describes and evaluates the process of major systems acquisition in the United States and the Pakistan Navy. It describes the process of initiation of the needs to the deployment of the system. The difference between the systems of the two countries are highlighted and based upon this comparative evaluation a model for the acquisition of major systems for the Pakistan Navy has been developed.

20 DISTRIBUTION / AVAILABILITY OF ABSTRACT	21 ABSTRACT SECURITY CLASSIFICATION
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	
22a NAME OF RESPONSIBLE INDIVIDUAL: Raymond W. Smith	22b TELEPHONE (Include Area Code): 408-646-2052; 22c OFFICE SYMBOL: 54 Sx

DD Form 1473, JUN 86 *Previous editions are obsolete* SECURITY CLASSIFICATION OF THIS PAGE

S/N 0102-LF-014-6603 Unclassified

Approved for public release; distribution is unlimited.

Procedures for acquisition of major systems
for
the Pakistan Navy

by

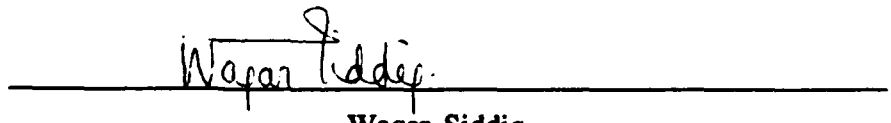
Waqar Siddiq
Lieutenant Commander, Pakistan Navy
B.Sc., L.L.B., Karachi University, Pakistan

Submitted in partial fulfillment
of the requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
December 1989

Author: 

Waqar Siddiq

Approved by: 

Raymond W. Smith, Thesis Advisor

Paul M. Carrick, Second Reader

David R. Whipple, Chairman
Department of Administrative Sciences

ABSTRACT

This thesis describes and evaluates the process of major systems acquisition in the United States and the Pakistan Navy. It describes the process of initiation of the needs to the deployment of the system. The differences between the systems of the two countries are highlighted and based upon this comparative evaluation a model for the acquisition of major systems for the Pakistan Navy has been developed.

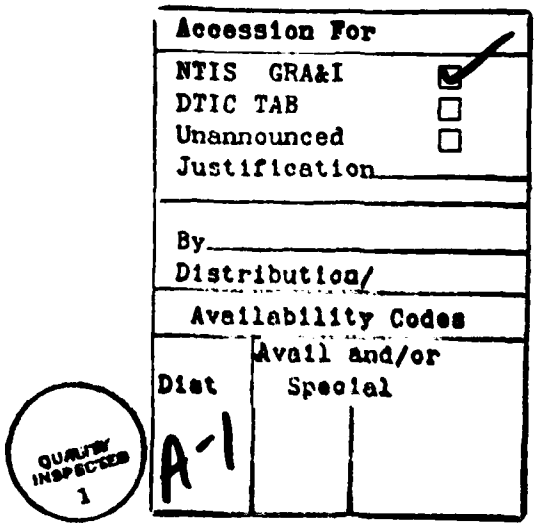


TABLE OF CONTENTS

LIST OF FIGURES

ACKNOWLEDGEMENTS

I wish to express my appreciation for the invaluable assistance given by my advisor, Professor Raymond W. Smith, without whose advice, encouragement and critical review this study could not have been accomplished. I would also like to acknowledge the efforts made by the professors of the Acquisition and Contract Management Curriculum specially Dr. David V. Lamm in imparting invaluable instructions during the duration of the course. I would also acknowledge the guidance provided by Professor Paul M. Carrick.

Finally, my wife Sadia and children Mubeen, Danish and Madiha deserve recognition for their support and patience.

I. INTRODUCTION

A. PURPOSE OF THE THESIS

Pakistan is a third world country and has very limited resources. The armed forces of Pakistan has been given the responsibility for defending its territories from any foreign aggression as defense forces of other countries of the world are tasked. Out of the constrained national budget a large portion is given to the armed forces, which is divided amongst the three services i.e., the Army, Navy and the Air Force proportionate to their requirements and size. The budget which is allocated to the Navy has to be utilized on not only the acquisition of new systems but for the operation and maintenance of old equipment. Although the Pakistan Navy does not frequently buy major systems, or buy them in large numbers, it is necessary that the acquisition process should be properly managed in order to have maximum utilization of the resources. The advancement in technology and increasing costs of the major systems requires continuous management attention. David Packard, a past Deputy Secretary of Defense said [Ref. 1:p. 9].

> I can think of no time in recent history when it has been more necessary to do a better job in acquiring major defense systems. In the first place, there will be continuing pressures on the defense budget over the next few years which will certainly tend to limit the funds we will have available for new defense systems and equipment.

This thesis will therefore develop a procedure for the major system acquisition for the Pakistan Navy. The development of the procedure is based on the existing practices under such conditions in the United States.

B. STATEMENT OF THE PROBLEM

The industry of Pakistan has never launched a prototype development of a major system. Consequently Pakistan has to acquire all her defense forces needs for weapon systems from friendly countries. The present system of acquisition has certain draw backs and limitations and therefore requires revision. Moreover, the problem is further aggravated by the fact that Pakistan has to purchase the systems from various countries. It is, therefore, necessary to have a procurement system which can be used with slight modification when acquiring systems from various countries. The procedure is important because the processes by which we acquire weapons today determine the capability of our forces in the future.

C. METHODOLOGY OF RESEARCH

The method of research used in the thesis is illustrated in Figure 1. Information on major systems acquisition is available from a wide range of resources. The primary source of information used is from the literature. A review on the previous studies, projects and thesis was carried out. M..terial was also selected from Defense Logistics Studies Information Exchange (DLSIE), and official directives and policies issued from time to time. In order to determine the current procedure for the acquisition of major systems in the Pakistan Navy, which is lacking in official documents, various officers of the Pakistan Navy were interviewed and also questionnaires were sent to them. Thus Chapter III of the thesis is based on information received through the interviews and questionnaires and some personal knowledge of the researcher.

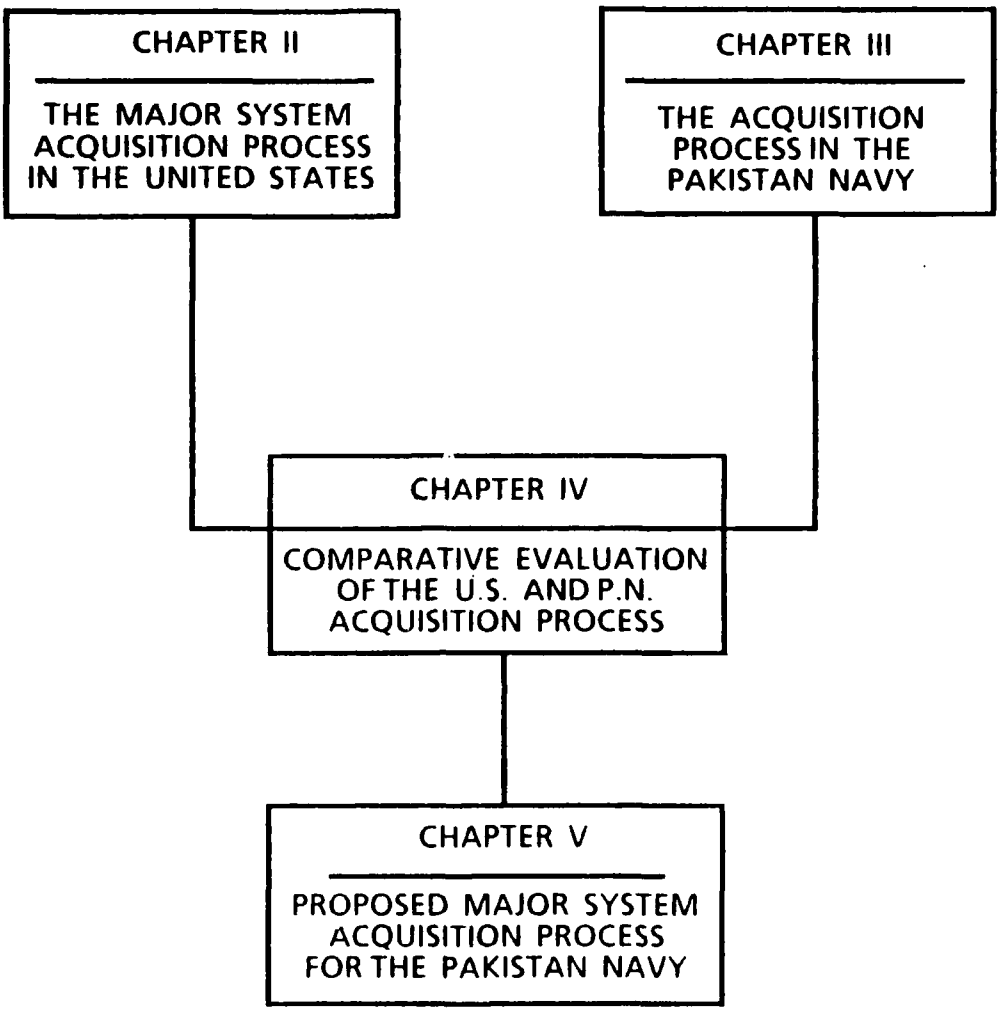


Figure 1 - Method of Research

D. PREVIEW

In Chapter II the author discusses briefly the history of the acquisition process in the United States. The major phases of the acquisition process are indicated followed by procedures currently in use by the United States Navy in acquiring major systems. The different phases and milestones in the process and significance of each has been described.

In Chapter III the author presents the current procedures being used by the Pakistan Navy in the acquisition of major systems.

In Chapter IV a comparative evaluation of the United States and the Pakistan Navy acquisition process is presented. The evaluation is concentrated on the main issues highlighting the differences and deficiencies in the existing procedures being used by the Pakistan Navy.

Chapter V contains a proposed method for the acquisition of major systems which is based on the evaluation done in the earlier chapter.

Chapter VI finally presents the conclusion and recommendations.

II. THE MAJOR SYSTEMS ACQUISITION PROCESS IN THE U.S.

A. GENERAL

The major phases of the procurement process as is currently being used in the United States Department of Defense are:

1. Acquisition Planning.
2. Solicitation.
3. Source evaluation and selection.
4. Negotiations.
5. Contract award.
6. Contract administration.

The Commission on Government Procurement published this model (Figure 2) in 1972 and is known as the GOCP model. This model is the most widely recognized model of the Federal procurement system [Ref. 2:p. 216].

B. HISTORY

The major system acquisition process in the United States Department of Defense has been receiving alterations from all the administrations in the past and is regularly modified as new teams come in. The changes are made in hope of increasing the efficiency of the system as the major systems take large portion of the national resources. Until early 1950's the traditional functionally oriented management organization that worked on several weapon systems simultaneously was used. The need for acquisition streamlining was felt in the late 1950's and thus concept of program management was

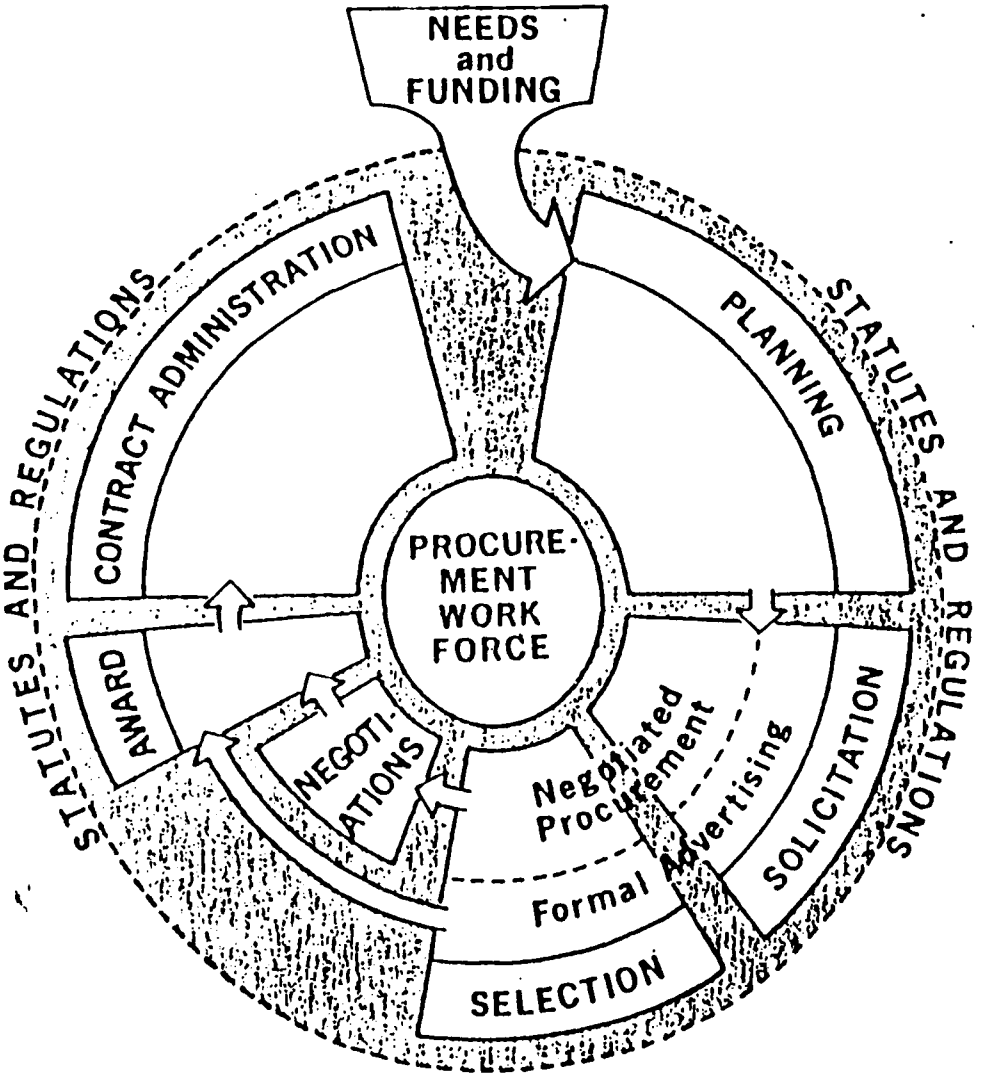


Figure 1 - Procurement Process

Source - Reproduced from [Ref. 1:p. 218]

introduced. Under this concept the key person of the program is the program manager. He is usually a military line officer, but can be a civilian with past experience with the system. The program manager comes into scene at milestone 0 when the program initiation decision (PID) is taken. He is the primary advocate of the program and is responsible for research and development, evaluation, production and effective overall management for his weapon system program.

Mr. Robert S. McNamara became the Secretary of Defense in Jan 1961. He instituted a number of changes in the existing system amongst which was the introduction of the Planning-Programming-Budgeting System (PPBS). The main elements of the PPBS were the program package, five year Defense plan (FYDP) and the use of system cost effectiveness analysis in the decision making process. Also a DOD Directive 3200.9 entitled "Project Definition Phase" was issued by Secretary Mcnamara which defined the concept formulation definition phase of a system. The purpose for this was to reduce risk and uncertainty of new major programs.

In 1969 when Mr. David Packard was Deputy Secretary of Defense, DOD instituted three formal approval points in acquisition of major systems known as milestones. These phases became known as concept formulation, validation, operational systems development and production. The mission needs phase or milestone 0 was added as a result of OMB Circular A-109.

In 1982 the Department of Defense acquisition process was further modified under Deputy Secretary Mr. Frank Carlucci. Milestone 0 remained as DOD's mission needs determination but became a part of the planning, programming, and budgeting process.

In July 1971 DOD Directive 5000.1 entitled "Major and non major Defense acquisition programs" was published for the first time. This directive has undergone a

number of refinements since then and the current directive which is now being used is of September 1987. This directive published the basic policy and major frame work for major systems acquisition process.

C. MAJOR SYSTEM ACQUISITION PROCESS

1. Definition of Major Weapon System

Acquisition of any system which fulfills the following criteria can be designated as a major weapon system:

a. Critical to mission need as determined by Secretary of Defense, and

b. Requires special management attention because of urgency of need, development risk, joint funding, significant Congressional interest, or

c. Requires an eventual total expenditure for research and development and test and evaluation of more than $ 200 million (based on fiscal year 1980 constant dollar) or an eventual total expenditure for procurement of more than $ 1 billion (based on fiscal year 1980 constant dollar). [Ref. 3:p. 2]

2. *Overview*

The concept of the system life cycle is utilized throughout the system acquisition process. Every system has a life cycle composed of planning, designing, developing, acquiring and disposing phases. The life cycle of the system starts with the perception of need and ends when the system is retired.

The major system acquisition process is divided into six milestones [Ref. 4:p. 2]. These are;

Milestone 0 - Approval or disapproval of a mission need and entry into the concept exploration/definition phase.

Milestone 1 - Approval or disapproval to proceed into concept demonstration/validation phase.

Milestone 2 - Approval or disapproval to proceed into full scale development and low rate initial production phase.

Milestone 3 - Approval or disapproval to proceed into full rate production and initial deployment phase.

Milestone 4 - Encompasses a review 1 to 2 years after initial deployment to assure operational readiness and support objectives are being achieved and maintained during the first several years of the operational support phase.

Milestone 5 - Encompasses a review 5-10 years after initial deployment of a systems current state or operational effectiveness, suitability and readiness to determine if major upgrades are necessary, or if existing deficiencies warrant consideration of replacement action.

OMB (Office of Management and budget) Circular A-109 establishes policies which are to be followed by executive branch agencies in the acquisition of major systems. According to this circular at specified points (milestones) approvals must be received from the agency head before proceeding into the next phase Figure 3. The general policy which is stated in the OMB Circular A-109 is reflected in DODD (Department of Defense Directive) 5000.1 and DODI (Department of Defense Instructions) 5000.2

The six milestones for the acquisition of major systems divide the process into five phases (each phase consists of activities which take place between two milestones) to enhance management effectiveness. The phases of the major acquisition process are:

Phase 1 - Concept exploration/definition phase.

Phase 2 - Concept demonstration/validation phase.

Phase 3 - Full scale development phase.

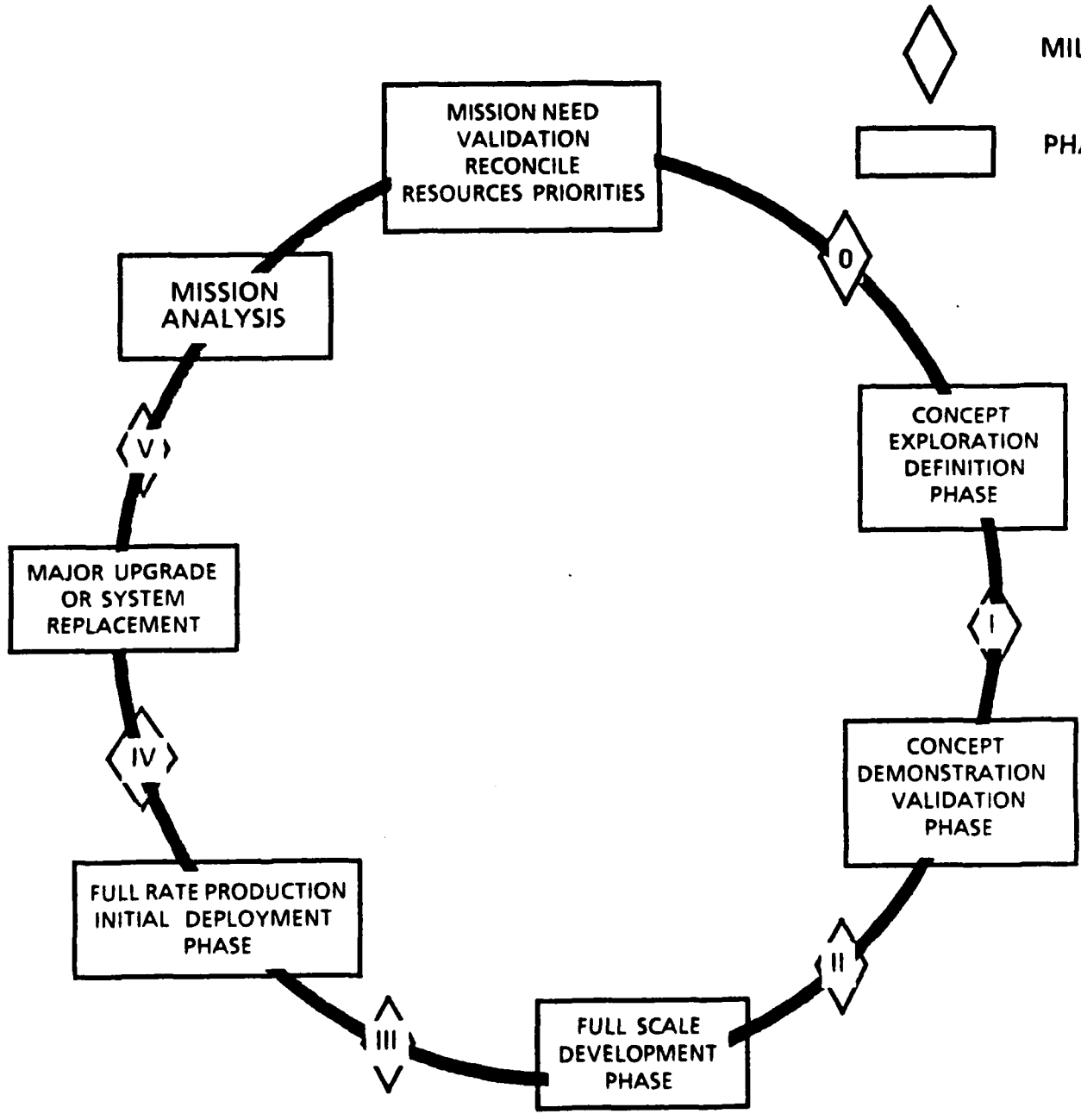


Figure 3 - Major System Acquisition Cycle

Phase 4 - Full rate production/initial deployment phase.

Phase 5 - Major upgrade or system replacement.

Figure 4 depicts these phases and milestones.

3. Mission Area Analysis

This is the period which is spent prior to starting a new system. The purpose of this period in the major system acquisition is to perform mission area analysis which is done by service organization to identify a threat from the areas in which existing or projected capability is deficient in meeting the essential mission needs. In fact the mission area analysis is going on all the time, technology base is being addressed and before starting a new system opportunities and possibilities are explored. Alternatives to starting a new program are the moderinizations, up-grade or service life extension. Most of the time a new system is started because of technological advancements. When a service decides to have a new system they prepare the mission need statement (MNS). The service states the need in terms of mission element and not hardware requirement [Ref. 5:p. 3]. This document (shown in Appendix A) outlines the needs to support the mission with the new system and identifies the technology involved, the known alternatives, affordability, logistics constraints and acquisition strategy. Mission need statement is submitted by the service to the Secretary of Defense for decision through the Defense Acquisition Board (DAB) and Defense Acquisition Executive (DAE). The approval of the Secretary of Defense is the milestone zero decision point and is given in the acquisition decision memorandum (ADM).

The other major documents which are involved in this milestone decision are the cooperative opportunities document (COD) which examines the possibilities for cooperation with allied nations regarding the acquisition of the defense program and

Figure 4 - Major System Acquisition Process

assess the advantages and disadvantages of a cooperative approach and Independent cost estimates (ICE). The cost analysis improvement group (CAIG) reviews the program office independent life cycle cost estimate and also prepares its own independent cost estimates.

4. Concept Exploration/Definition Phase

This is the first phase and is between the milestones 0 and 1. Once the program is approved, budget for the new program is allocated and a program manager (PM) is assigned. The program manager is given a charter of duties. The program manager in order to fulfill his responsibilities establishes the project management office. One of the important application to the management theory in development of the project management concept is the project management organization. The size and organization of his office varies from program to program. The two different organizations which are generally seen in the program management offices are the pure or the matrix management organizations. In the pure management organization the program is managed with the various functional departments. These departments are responsible to the program manager for the activities in that area of specialization. In the matrix organization there are certain departments which are not placed under the direct supervision of the program manager. Thus the program manager has to depend on the functional groups for accomplishment of his tasks. As has been mentioned earlier the selection of the type of organization depends from program to program as each type of organization has advantages and disadvantages. The key personnel in the program office are shown in Appendix C.

After establishing the project management office, the program manager writes the acquisition strategy. The acquisition strategy is written within 90 days after reaching milestone 0. The acquisition strategy describes the project and how the things are planned for its accomplishment. It includes following:

1. Use of the contracting process as an important tool in the acquisition program.
2. Scheduling of essential elements of the acquisition process.
3. Demonstration of proto type models.
4. Test and evaluation criteria.
5. Funding estimates.
6. Planing for competition in different phases.
7. Content of solicitations for proposals.
8. Decisions of whom to solicit.
9. Methods for obtaining and sustaining competition.
10. Guidelines for evaluation and acceptance or rejection of proposals.
11. Goals for design-to-cost.
12. Methods for projecting life cycle costs.
13. Use of data rights.
14. Use of warranties.
15. Methods for analyzing and evaluating contractor and Government risks.
16. Need for developing contractor incentives.
17. Selection of type of contract best suited for each stage in the acquisition process and administration of contracts.

In the acquisition strategy process the key to success is the ability to conceptualize the program into of the out years. It is looking at the total program all the way out to ownership and up to disposal. It looks at all the disciplines, cost, schedule, technical performance and logistic supportability.

The purpose of the concept exploration definition phase is to select the most promising system/concepts for demonstration and validation phase. During this phase technical, military and economic needs for an acquisition program are established through

comprehensive system studies. This phase is paper oriented and research and development (R&D) contracts are given to contractors who look at conceptual kinds of activities. During this phase some relatively small dollar value contracts are awarded to pursue the technology. The contractors are trying to identify and define the system and then carry out analysis of threat, costs and risks involved in developing the system. The evaluation of alternative concepts is done based on the factors determined in the acquisition strategy and one or more concepts are recommended for concept demonstration validation phase.

5. Concept Demonstration Validation Phase

This is the second phase in the major system acquisition and is between milestone 1 and 2. During this phase major program characteristics are validated and refined and the contractors demonstrate their ideas/designs. The objective of concept demonstration/validation phase is to establish that the needed technology is in hand to identify the concept(s) with greatest potential i.e., to develop and document a system which is affordable and meets mission needs. The emphasis are on the development and evaluation of hardware rather than to paper studies. In the major system acquisition arena it is common to down select one hardware solution which meets the mission needs. In this phase the goal is to have at least two contractors or contractor teams which are competing for the same or separate designs. These objective are achieved by carrying out thorough and extensive study and analysis of the alternatives selected.

At the end of the demonstration and validation phase the DAB reviews the program and gives recommendations for Secretary Defense approval consideration. The approval is granted by the Secretary of Defense in the acquisition decision memorandum (ADM) to proceed to next phase of the program.

6. Full Scale Development Phase

This is the third phase and is between the milestone 2 and 3. Full scale development starts when the developmental model or prototypes of the contractor completed. The proto-type models are used to evaluate the systems ability to meet the design and operational requirements by means of test and evaluation. The objective of this phase is to develop and document a system which is affordable and meets mission needs. Selecting one most suitable system. There are three sub phases in this phase. These are:

a. Engineering

This sub phase can further be subdivided into three subphases i.e. designing, testing and analysis of those tests, and based on these analysis, redesigning.

b. Prototype

This is the hardware developmental phase. All the designing is put together either in the entire system or at least major subcomponent of that system. The required hardware is demonstrated by the contractor. During this phase the technical and operational evaluation of the system is carried out. In this sub phase the contractor is basically designing-building-testing and redesigning. There are three design reviews which are carried out and these are preliminary design review (PDR), critical design review (CDR), and design certification review (DCR). This is the formal review of the final design prior to start the production.

c. Pilot Production

After the design certification review pilot production is started. The transition from development to production is the critical area of this phase. The purpose of the pilot production is to proof the design and production process.

7. Full Rate Production/Initial Deployment Phase

This is the fourth phase in the process of major system acquisition. The objective of this phase is to reproduce the system and achieve desired operational capability and inventory requirement. This phase represents a major commitment of resources to procure a system in sufficient quantity to satisfy the requirement of the service. Emphasis is shifted from design to quality assurance to ensure that the production models meet the performance requirement previously demonstrated by the prototypes. As the system is produced it has to be handed over to end users for operation. Once the system is out in field it has to be supported and maintained to the desired availability state.

8. Major Upgrade or System Replacement

After the system has been used for a number of years a review of systems current state or operational effectiveness, suitability and readiness is undertaken. The review is undertaken to determine whether major upgrades are necessary or deficiencies warrant consideration for replacement. This review takes place some where between 5 to 10 years after initial deployment.

III. THE ACQUISITION PROCESS IN THE PAKISTAN NAVY

A. GENERAL

This chapter describes the management process for a major system acquisition as it is presently performed by the Pakistan Navy. The methodology used by the Pakistan Navy for the management of the acquisition of a major system is described in terms of the sequence of implementation and is developed stage wise. The basic stages are:

1. Operational requirement.
2. Source selection.
3. Procuring agency.
4. Contracting.
5. Program manager.

B. OPERATIONAL REQUIREMENT

1. Definition

The acquisition of any system is started when there is operational requirement. These requirements may arise due to any of the following reasons:

a. to meet the out growth of a new need.

b. due to changes in the goals or missions.

c. to replace an existing system.

d. when the technology becomes obsolete creating a deficiency in the existing system capabilities.

Requirements are thus determined by operational needs and deficiencies which cannot be met with the existing capabilities.

2. Requirement Initiation

The requirement for major systems are determined out by the Plans Division in the Naval Headquarters after taking into consideration the operational needs and deficiencies. Requirements in some cases are also initiated by the operational area commanders and forwarded to the Plans division.

3. Approval Process

In order to explain the approval process it is necessary to explain organization of the Naval Headquarters. Figure 5 depicts the organizational set up of the Naval Headquarters. The acquisition of a major systems is looked after by the Directorate of Projects under the Plans Division from its inception until final deployment. However, initial studies are done by the Directorate of Projects for acquisition of ships, the Directorate of Naval Aviation in case of a Naval Aviation requirement, other weapon systems and sensors are looked after by the Directorate of Naval Weapons and Equipment. After carrying out the initial studies the case is transferred to the Directorate of Projects. This directorate is headed by an officer of the rank of Captain and has officers of the Engineering, Supply and Electrical branches on his staff.

While working on the major systems acquisition requirements/inputs from other directorates like the Directorate of Naval Construction (DNC), the Directorate of Ships Maintenance and Repairs (DSMR), the Directorate of Naval Aviation (DNA), the Directorate of Technical Stores (DTS), and the Directorate of Naval Weapons and Equipment (DNWE) are also obtained. Once the requirements are consolidated, Naval Staff Requirements are made by the Plans Division. The Naval Staff Requirement which not only states the need but also recommends feasible technological hardware solutions to it. Depending upon the operational requirement the characteristics of the system are

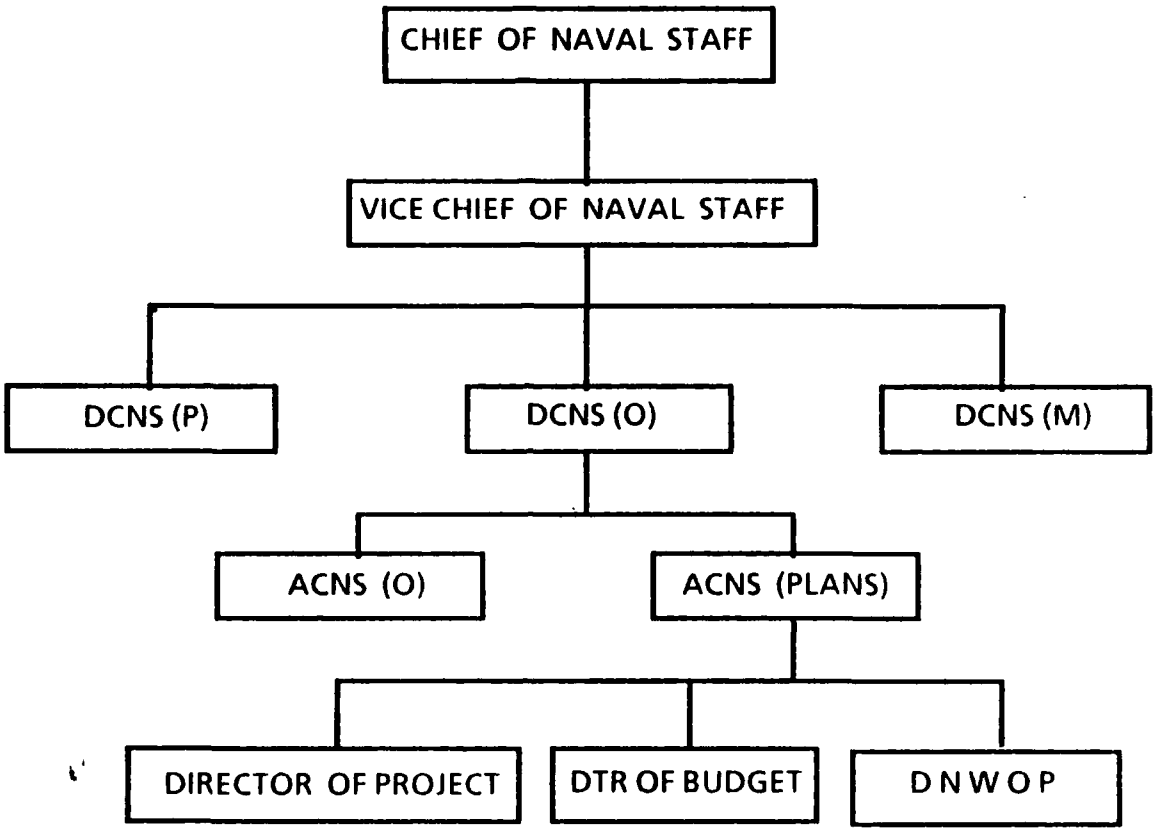


Figure 5 - Organization of Naval Headquarters

also worked out. The fully staffed acquisition plan is then forwarded to the Chief of Naval Staff for his approval.

Once the Naval Staff Requirements are approved by the Chief of Naval Staff, the Directorate of Project will make the case for acquisition of this system. A formal presentation is given by the Director of Projects concerning the system and the feasible alternate solutions. This presentation is attended by all Principal Staff Officers (PSO's) and Directors at Naval Headquarters. After clarifying all pros and cons and incorporating any new ideas the case is forwarded to the Chairman of the Joint Chiefs of Staff Committee. The Chairman Joint Chiefs of Staff Committee, submits the case, along with his recommendations to Defense Cabinet Committee (DCC) for its approval. The Defense Cabinet Committee which is headed by the Prime Minister considers the operational/strategical requirement of all the three services and approves the acquisition of the system in principle.

C. SOURCE SELECTION

Upon approval of the necessity of this requirement by the Defense Cabinet Committee, a consolidated case is prepared by the Plans Division at the Naval Headquarters. A letter of intent describing all the details of the system is issued to the potential suppliers, giving them the requirement in terms of hardware. The performance parameters of the system is also indicated. However, prior to issuing the letter of intent, no source selection plan is made. Based on the hardware requirement given, the supplier/manufacturer responds and presents the designs of the equipment, technology to be used, period of manufacture, approximate cost and a draft contract. The Directorate of Projects evaluates all the proposals. A comparative statement is prepared. The factors

of evaluation are the cost and technical performance, cost being the primary factor. All this is done by the Directorate of Projects. While evaluating the proposals and draft contracts it is determined whether the proposals meet the characteristics given or not. As a result of this evaluation one technology/proposal which is suitable is selected. All the proposals along with the one which is selected are submitted to the Chief of the Naval Staff for his approval. The Chief of the Naval Staff approves in principle the most technically suitable system.

D. PROCURING AGENCY

Once the technically suitable system has been selected, then the case is transferred to the Director General Defense Purchase (DGDP). Before proceeding it is necessary, especially for the American reader, to briefly describe the organization structure and functions of the Director General Defense Purchase.

1. Organizational Structure

A single joint Service Organization called Directorate General Defense Purchase is established under the Ministry of Defense.

There will be three separate Directorates of Procurement, one for each service. The Directorates of Procurement Navy and Air Force are under their respective Service Headquarters for functional control and under the Director General Defense Purchase for administrative control.

The Directorate General of Procurement (Army) works directly under Director General Defense Purchase, for all purposes including functional and administrative control.

The organizational structure of defense purchase is shown in Figure 6.

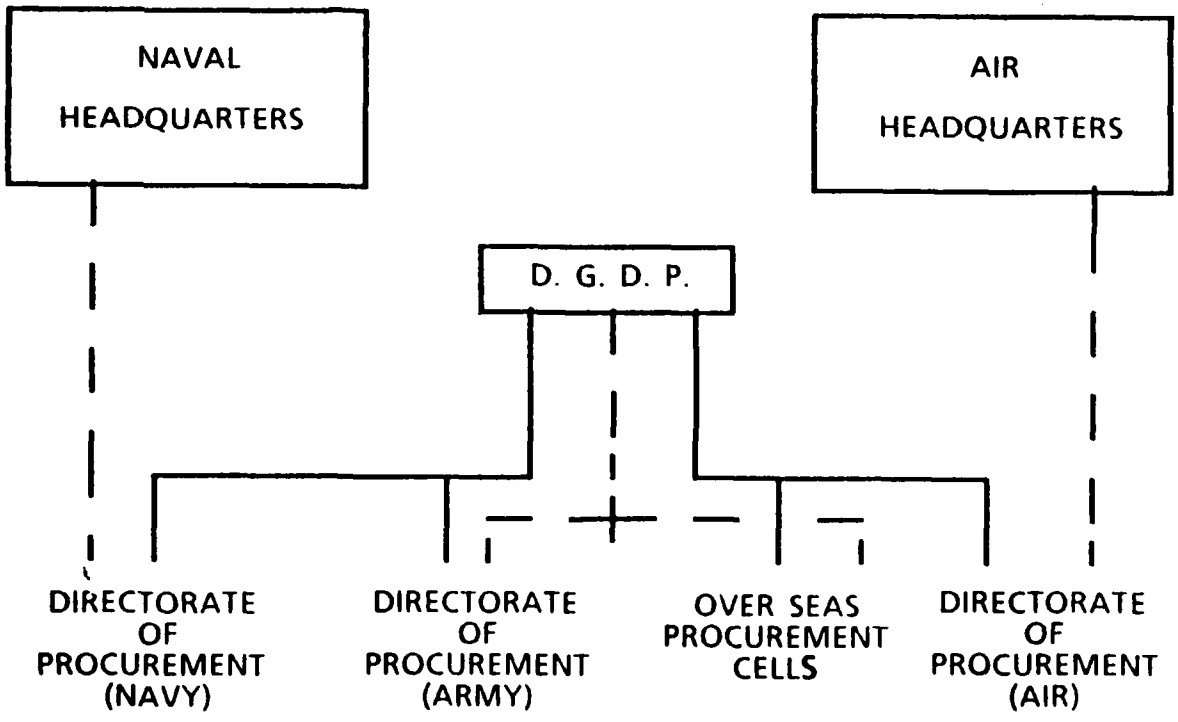


Figure 6 - Defense Purchase Organization

2. Functions

The Directorate General Defense Purchase is responsible for:

1. Economic and speedy procurement of all Defense Stores based on priorities assigned by Service Headquarters.
2. Overall procurement policy for the Defense Stores.
3. Policy directives on the following matters:
   a. Shipping, e.g.,shipping lines with which to deal.
   b. Import licenses, e.g.,Government policy on the granting of import licenses and imposing restriction under Government orders.
   c. Insurance policy, e.g., kinds of stores which may be insured, insurance companies to be employed and any other policy matters.
4. Purchase procedure.
5. Contractual forms and agreements.
6. General policy directives dealing with procurement.
7. Policy instructions on disposal of stores.
8. Policy directives on registration of firms.
9. Provision of full administrative support to the three Directorates of procurement.
10. Loans, credits and barter deals with foreign Governments in respect of Defense Stores in consultation with Service Headquarters.

3. Overseas Procurement Cells

The overseas procurement cells work as joint Service Organizations under Directorate General Defense Purchase.

E. CONTRACTING

On receipt of the case the Directorate General Defense Purchase will issue the request for proposal. It will be issued to the contractor whose proposal was technically accepted by the Naval Headquarters. On receipt of the proposal it is studied in detail. The negotiations are then held at the Directorate General Defense Purchase. The

negotiations are attended by a representative of the Naval Headquarters. Once the negotiations are completed Directorate General Defense Purchase submits the case to the Finance Minister for confirmation of the availability of funds. Finally the case goes to the Prime Minister for his final approval. On approval by the Prime Minister, Directorate General Defense Purchase then awards a fix price type contract to the contractor.

F. PROGRAM MANAGER

After the issuance of the contract a program manager is nominated. The program manager is responsible for overseeing the quality of work and the progress of the contract. During the construction phase, he will forward any change proposals which are either recommended by the contractor or which he considers appropriate. The change proposals/modifications are approved by the Directorate of Naval Weapons and Equipment at the Naval Headquarters. The price of the system will then be adjusted accordingly.

IV. COMPARATIVE EVALUATION OF THE UNITED STATES AND THE PAKISTAN NAVY ACQUISITION PROCESS

A. OVERVIEW

In Chapter II the system acquisition and project management process currently in practice in the United States Department of Defense has been described. In Chapter III the current procedure of the major system acquisition used on all foreign acquisitions in the Pakistan Navy has been described. In this chapter the Pakistan Navy acquisition process is evaluated in comparison with the United States process for the acquisition of a major system. The evaluation is concentrated on the main issues highlighting the differences and deficiencies in the existing procedures being used by the Pakistan Navy.

B. COMPARISON

Comparison and evaluation of the two processes are as follows.

1. Requirement Initiation

In case of the United States Navy the acquisition cycle starts with the mission area analysis. Acquisition of new system is started when there is technological advancement, to meet some threat or is based on mission need. The mission need statement is prepared which identifies the technology involved, known alternatives, affordability, logistics constraint and acquisition strategy. In the mission need statement the service states the need in terms of mission. In case of the Pakistan Navy, although the requirements are initiated on similar grounds, (the term used is operational requirements) there is no specific document for doing this nor are all the factors which

are identified in mission need statement covered. Moreover when the requirement is initiated a feasible technological hardware solution is also recommended.

2. Program Manager

In the United States the program manager is appointed during the concept exploration/definition phase. He is given a charter of duties and establishes his office. There are separate program managers for each program. The program manager and his office are the key element of any acquisition of a major system. After appointment, the program manager takes over all the task of that particular program. He is usually a military line officer and is the key advocate of the program (Appendix B). The concept of a program manager is based on the idea of having a central management which integrates all the necessary activities to carry out the project under the direction of a single manager with decision authority. In the Pakistan Navy there is the Directorate of Projects which looks after all the programs. The duties and responsibilities of the Director of Projects includes the coordination with other directorates and issuing of the letters of intent to the potential suppliers.

3. Approval Process

In the United States the frequency of purchase of major systems is greater and therefore the process of approval is structured. The approval for starting a new program is given by the Secretary of Defense through the Defense Acquisition Board and is the milestone 0 decision point. In the Pakistan Navy, the number of major systems purchased is limited and the approval is given by the Defense Cabinet Committee which is headed by the Prime Minister.

4. Structure of Acquisition Process

In United States the acquisition process is clearly defined and structured. The process consists of 5 phases and 6 milestones. The milestones are the decision points and after completion of each phase approval from the agency head has to be received to start the next phase. The advantage of the structured system being used in the United States is that it provides opportunity to control and assess the acquisition strategy during each phase of the acquisition. During the approval process if the agency head considers that the program is not yet ready to proceed to next phase, he can direct the program manager to rectify certain shortcoming before approval can be granted. Thus the activities already performed before reaching each milestone are evaluated and approval for entering into the next phase is given. In case of the Pakistan Navy there are no phases or milestones laid down where an approving authority gives approval to start a new phase of the program.

5. Phases 1, 2 and 3

The three phases (phase 1, 2 and 3 which are the concept exploration/definition, concept demonstration validation and full scale development phases respectively) of the acquisition process are in fact the heart of the process in United States because in these three phases a concept is explored, defined, demonstrated and developed. In phases 1 and 2 there are number of contractors who are competing but for the phase 3 the best alternate is selected and developed. These 3 phases are essential in United States acquisition process because the United States Navy is the leading Navy of the world and in order to maintain its superiority and to discharge its assigned role it needs latest state-of-the-art equipment. In order to obtain this a lot of research and development efforts are performed. These research and development efforts are done

inhouse i.e., by government owned research and development laboratories or by the contractors. The subject of research and development by itself is very vast and is outside the scope of this thesis. Therefore, in short it may be stated that research and development is absolutely essential for the United States Navy to ensure that the role assigned to it is carried out effectively.

In the case of the Pakistan Navy as has been mentioned earlier, there are no milestones or phases of the acquisition process. Moreover the Pakistan Navy, being small in size, with limited requirements and resources as compared to the United States Navy, does not carry out any research and development work. The primary reason for not doing any research and development work in the defense production division are the financial constraints and the lack of any defense industrial base. The Pakistan Navy, therefore, acquires systems which have been fully developed.

6. Process of procurement

In the United States once it is determined that there is a need for a new major system (milestone 0), a program manager is appointed and program office established. The organizational structure of the program management office is either pure or matrix, depending upon the type of program. Whatever the case may be, all the issues of contracting are handled by the contracting officer. In case of the Pakistan Navy, the Directorate of Projects handles the case and issues the letter of intent to the potential suppliers, receives their proposals and evaluates them. For evaluation of the proposals a point system is used. A comparative statement is prepared which is submitted to the Chief of Naval Staff alongwith the recommendations of the Director of Projects. The most technically suitable system is provisionally selected. Once this has been done then the case is transferred to the Director General Defense Purchase for doing contract

formalities. Thus the case is transferred to the contract specialist after selecting the source.

C. IMPORTANT DOCUMENTS

1. Acquisition Strategy

A strategy is the pattern or plan that integrates an organization's major goals, policies, and action sequences into a cohesive whole. A well-formulated strategy helps to marshal and allocate an organization's resources into a unique and viable posture based on its relative internal competencies and shortcomings, anticipated changes in the environment, and contingent moves by intelligent opponents. [Ref. 6:p. 3]

The acquisition strategy is a conceptual approach and describes the program and how it is going to be accomplished on overall basis. It includes funding estimates and plans for competition. It encompasses program objectives, direction and control through the integration of strategic, technical and resource concerns. It is necessary in order to give the program an objective in writing. It is structured at the outset of the program to provide an organized and consistent approach to meet program objectives within known constraints. The acquisition strategy is written by the program manager immediately after his appointment. The document is continuously updated and modified by the program manager as more information is acquired and the program moves ahead. It is realistically tailored to the program objectives and constraints but is flexible enough to allow innovation and modification as the program evolves. The acquisition strategy provides an organized and consistent approach and serves as a master check list ensuring that all important issues and alternatives are considered. It serves as the baseline for preparing the plans and activities to accomplish the program. The primary purpose of the

acquisition strategy is to prioritize and integrate many diverse functional requirements, to evaluate and select from among the important issue alternatives, to identify the opportunities and times for critical decisions and to provide a coordinated approach to achieving program objectives economically and effectively. [Ref. 7:p. 1-2]

In the case of the Pakistan Navy no acquisition strategy is made.

2. Source Selection Plan

In the United States the major weapon systems acquisition policies and procedures place a heavy emphasis on the source selection process. In case of major systems there is a formal organization which performs source selection. It is one of the most important, significant and crucial parts of the process. The objectives of the process are.

1. Select the source whose proposal has the highest degree of realism and credibility based on the requirements.
2. *Evaluate the contractors* fairly to assure impartial, equitable and comprehensive evaluation of competitors proposals.
3. Maximize efficiency and minimize complexity of the solicitation, the evaluation, and the selection decision, selecting the optimal proposal.

Source selection is considered early in the acquisition planning phase. The source selection plan is prepared before request for proposals are issued and tells how the source selection is to be conducted. The important evaluation criteria of the proposal are determined. The relative order of importance of factors i.e., cost, technical performance, management and logistic supportability is given. The draft source selection plan is written by the program manager but is approved by the source selection authority. The program manager is an advisor in the process but not a member. Normally various boards are formed to evaluate the proposals.

In the Pakistan Navy no formal source selection plan is made. The evaluation of the proposals is done by the staff officers of the Directorate of Projects with the assistance of other directorates whereever needed.

D. OTHER FACTORS

1. Local v/s Foreign Procurement

One of the most important and significant difference between the two processes of acquisition of major systems is that the United States Navy buys almost all of their requirements from the domestic firms whereas the Pakistan Navy has to rely 100% on foreign suppliers. This factor opens numerous problems and issues to be tackled. There are a few systems which the United States Navy has purchased from foreign suppliers but in spite of the fact that there is a structured acquisition system and a lot of resources to handle such programs, problems were faced on various fronts. The primary reason why United States engages in the foreign acquisition is the Rationalization, Standardization and Interoperability (RSI). As early as 1974 Congress was aware of the pressing need to improve rationalization, standardization and interoperability (RSI) within NATO. Calling for standardization, the Culver-Nunn amendments, were included in the DOD Appropriation Authorization Act for FY 1975. Later, additional amendments were added to the DOD Appropriation Authorization Acts for FY 1976 and FY 1977 that would allow a waiver of the Buy American Act in the interest on standardization within NATO. Many documents followed all aimed at foreign acquisition and improving RSI. Congress is in agreement, that personnel stationed in Europe and serving in some function of NATO should be equipped with standardized or at least interoperable items with the rest of the members of NATO. Therefore items

procured should be standardized. Since each country views the threat differently they tend to define the requirements differently so all must work out some type of cooperative agreements for procurement. To do this the following major initiatives were created to achieve increased RSI.

Establishment of general and reciprocal Memoranda of Understanding (MOUs) with NATO member nations, Japan and other allies. These are intended to encourage bilateral arms cooperation and trade, establish regular review of armaments programs and trade, and make efficient use of Alliance resources through expanded competition. In Memoranda of Understanding the United States government enters into agreements with other friendly governments to purchase and sell defense equipment and logistics support. The objective of such agreements are to waive the "Buy National" requirements, enable joint research, development, production and procurement, and enhance RSI. There are a variety of MOUs and agreements each for a different aspect of acquisition. In general the MOUs are a tool for setting down in writing the understanding between two nations and gives the governments the responsibility of enforcing on industry the policies and procedures set forth in any business contract.

Negotiation of Dual Production or coproduction of developed or nearly developed systems. Under this approach, a nation that has already developed a system which is valuable to the alliance would permit others to produce this system and thus avoid the undertaking of redundant developmental programs. Dual production programs can lead to the near-term introduction of weapon systems with the latest technology in NATO's deployed forces and a more efficient use of resources.

Creation of Families of Weapons (program packages) for systems not yet developed. Under this concept, participating NATO nations would reach early agreements

of the responsibility for developing complementary weapon system within a mission area. The approach is to examine the weapons that member nations plan to develop in the next few years, aggregate these weapons by mission area, and then coordinate the development of equipment when feasible. The idea is that the shortcomings of individual weapons systems can be overcome by a collaboration that contains several similar weapons.

2. Contractual Aspects

It is important to understand clearly whose rules and regulations are to be used. In United States there are certain international agreements with European nations which govern the acquisition. Essentially these agreements provide that U.S. may carry out European acquisition in one of three ways:

1. by acquisition under the United States laws and regulations without significant constraints by the country where the acquisition is being accomplished.
2. by acquisition only through an agency of the government where the acquisition is being accomplished and under the laws and regulations of that country.
3. by acquisition under a mixed procedure where U.S. regulations apply in some situations while the regulations of the country where the acquisition is being accomplished apply in other situations. The last procedure is the one which is most commonly used in Europe. [Ref. 8:p. 7-10]

Another legal consideration concerns contract disputes. In this particular area the only resort is the direct diplomatic negotiations between governments as United States Disputes Act of 1978 is not applicable to foreign acquisition. [Ref. 8:p. 7-16]

Since the Pakistan Navy contracts for her needs from various countries, no one law can be used. There are no specific laws or regulations for the acquisition of defense equipment in Pakistan. At the time of negotiation if it was agreed to contract under

Pakistan laws then common law is used, otherwise the law of the supplying country is used.

3. Acquisition Regulations

In the United States there are Federal Acquisition Regulations (FAR). These regulations were introduced in 1947 and have been continually changing and becoming more complex ever since. Contractors who deal with the Department of Defense are expected to know these regulations and to conform to them.

There are no similar acquisition regulations used by the Pakistan Navy.

4. Contract Administration

In the United States the Department of Defense has several options for the administration of the contract, these are:

1. Contract administrative services (CAS) may be performed by CAS of the specific nation.
2. The U.S. CAS may be assigned to the particular area, and
3. A separate CAS organization can be established specifically for that program/contract.

The contract administration in foreign procurement depends on nature of work, contract type and of international agreements. Department of Defense has either of three types of international agreements with the country from whom the system is being purchased, these are:

1. reciprocal agreements
2. FMS/off sets agreements, and
3. treaty/international agreements.

Figure 7 depicts the three types of international agreements.

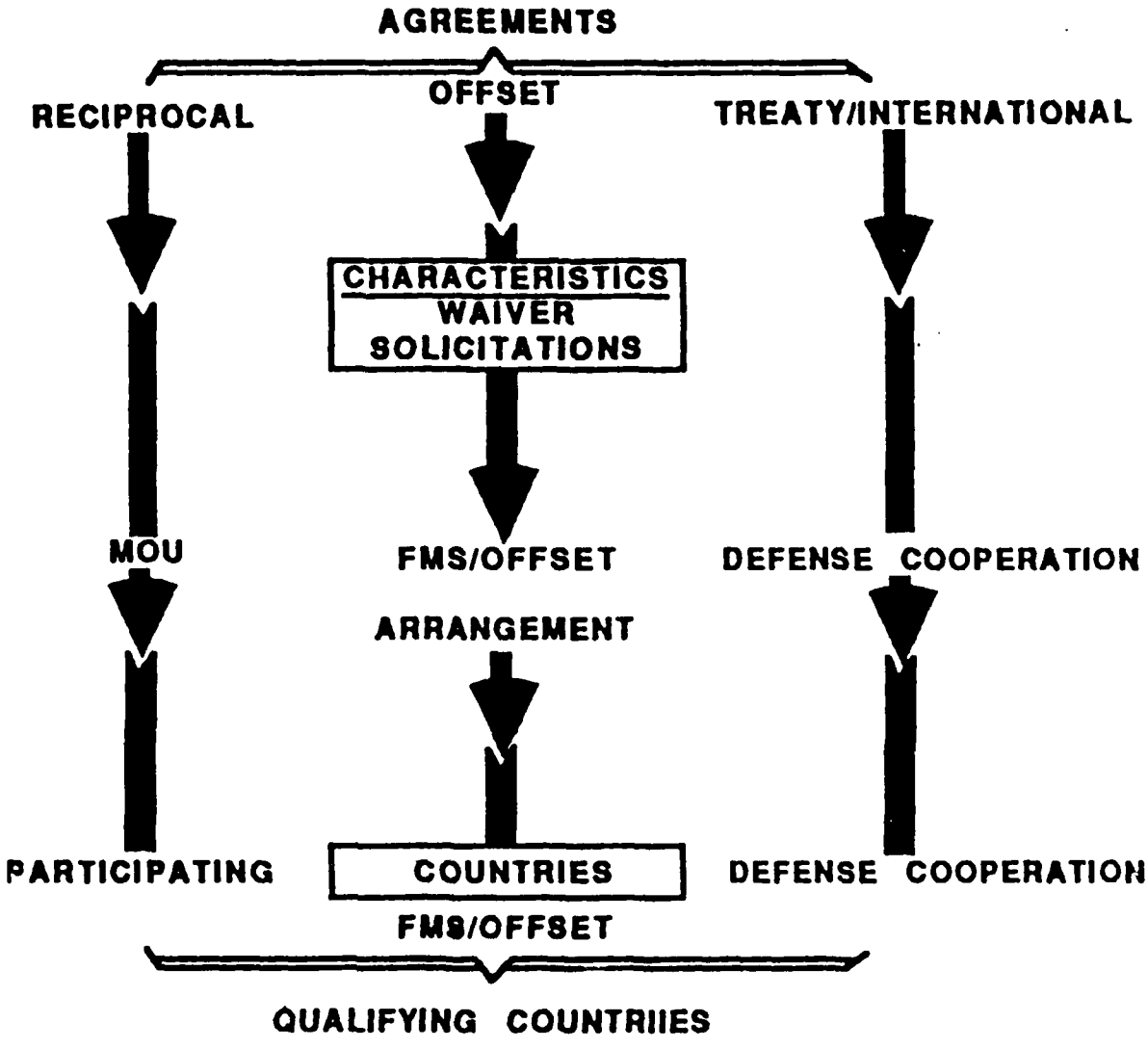


Figure 7 - Foreign agreements Classifications

Source - Reproduced from [Ref. 8:p. 10-23]

Reciprocal agreements encompass any NATO country which has a MOU or similar agreement with the U.S. These countries are identified as participating countries and are covered by a blanket Secretary of Defense Determination and Finding waiving Buy American Act restrictions.

Offset agreements are identified as any foreign country having an offset arrangement negotiated in conjunction with Foreign Military Sales and which arrangement provides for obtaining a wavier of Buy American Act restrictions on a case-by-case basis.

Lastly, treaty/international agreements cover those foreign countries having a defense cooperation agreements and for which a Determination and Finding has been made by Secretary of Defense waiving Buy American Act restriction for a list of mutually agreeable items.

In case of the Pakistan Navy there are no such MOUs or agreements with the foreign countries which could assist in contract administration. It is evident that the administration of the contract will largely depend upon the contents of the contract and the nature of agreements with the supplying government. It is thus necessary that the contract be integrated, as far as possible, clearly specifying the requirement which is understandable by all the participants. This is important in foreign procurement when there is a language barrier and the things could be interpreted differently. This is extremely important point which the buyers must appreciate. Only this type of perspective can give the buyers an insight into matters such as the important elements of business etiquette in the sellers country, the capabilities of the foreign country commitments, and their political stability. Without such insight and knowledge, fully successful purchases/contract administration are impossible.

5. Quality/Specifications

The issue of specifications and or quality may pose another problem in contract administration. The principal difficulties focus on three dominant factors, these are:

1. Scarcity of international standards
2. the problem of weights and measurement as U.S. is the only major manufacturing nation who has not yet adopted the metric system
3. the real possibility that foreign products entail greater obsolescence risks and longer corrective cycles for design changes than do U.S. products. [Ref. 9:p. 136]

6. Audit

It will be preferred by U.S. Government that the audit of foreign contracts be performed by the DCAA. However, foreign firms and governments may insist on the use of their own auditors. If auditors of foreign governments are allowed to act as representatives of the U.S. in auditing foreign contracts and subcontracts then this will be another area that will cause significant problem in contract administration.

7. Contract Type

There are two major types of contracts which can be used in the United States Department of Defense. These are fixed and cost reimbursement types. The type of contract which is to be used depends upon the type of system being procured and the acquisition phase. If the system being procured was a stable design and has limited or no risks involved, then a firm fixed price type of contract is used. In all other cases as has been mentioned earlier the contract type will depend upon the phase and the work involved. The major factor for choosing contract type is the quality of specifications. If the specifications are good then fixed price type can be used but when the specifications are not clear the cost reimbursement type of contract has to be used.

In the early phases of the acquisition process the cost reimbursement type of contracts are used. As progress is made in the process and the specifications and design are stabilized fixed price type of contracts are used.

The Pakistan Navy, since it purchases developed systems, uses firm fixed type of contracts only for all the acquisitions.

V. A PROPOSED MAJOR SYSTEM ACQUISITION PROCESS FOR THE PAKISTAN NAVY

A. GENERAL

The management of a foreign acquisition program can be viewed as a challenge. The personnel associated with the program have to determine what is necessary to be performed in order to accomplish the project within the established cost, schedule and performance goals. Other factors which are important considerations are the culture, attitudes, human behavior and national priorities of the country with which these acquisition personnel are involved.

In this chapter a proposed major system acquisition process for the Pakistan Navy is presented as a result of evaluation of two systems in the previous chapter. This proposal tries to integrate the United States policy and methods with the existing concept of the Pakistan Navy acquisition process.

The proposed process which consists of 5 phases basically utilizes the concept of systems life cycle throughout the system acquisition process. It is necessary to have the life cycle concept because under this concept obsolete and out dated equipment which cannot meet the requirements gets replaced automatically. The systems life cycle consist of planning, acquiring and deploying phases. This is a orderly process which permits management to make program decisions within a paced, step-by-step sequence of specified phases and decision points. The proposed phases of acquisition process are as follows:

Phase 1 - Determination of operational requirements.

Phase 2 - Approval process with the Government.

Phase 3 - Procurement phase.

Phase 4 - Contract administration.

Phase 5 - Handing over the system to the PN/deployment/system performance.

The proposed phases are shown in Figure 8.

On critical examination of this process it can be observed that the recommended procedure carries out the acquisition of major systems in two parts. First, the requirement determination, approval process and acquisition phase and deployment. This part of the acquisition process is done within the country. The second half i.e., contract administration will have to be done outside the country and at the site of the contractor. Presently the concept of contract administration is not being applied and instead the systems being purchased are warranted. Thus it is considered that if the systems are warranted, contract administration is not required. The contract administration which is an integral part of the acquisition cycle has been included in the process as phase 4. Also ways and means for contract administration are recommended.

B. DETERMINATION OF OPERATIONAL REQUIREMENT

Phase 1 of the systems acquisition process will start with the requirement determination process. The requirement in case of the Pakistan Navy arises due to the reasons mentioned earlier in Chapter III section B. However, the need may be based on such considerations as deficiencies in force size, obsolescence and venerability of systems and equipment, technological advancements and potential for life cycle cost savings. [Ref. 10:p. 10]

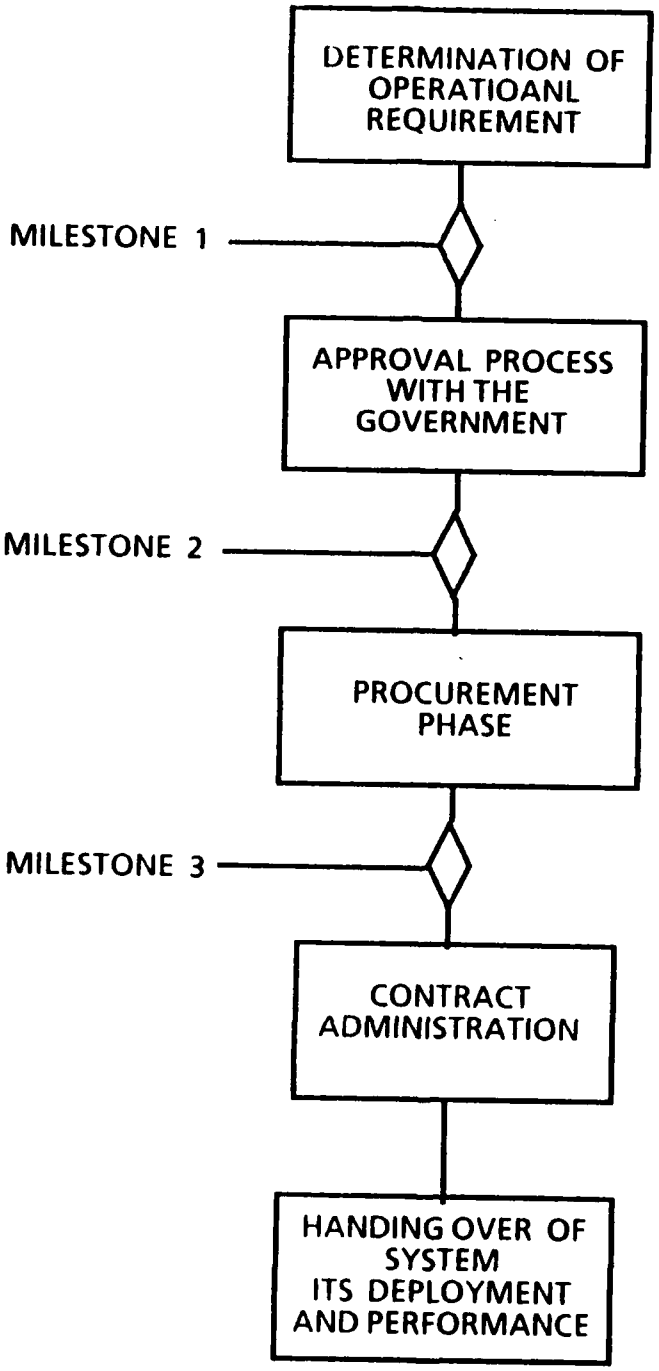


Figure 8 - System Acquisition Process

The requirement may be initiated by the operational area commander or Naval Headquarters. The agency initiating the requirement should prepare a document similar to mission need statement (Appendix A) and can be termed as operational requirement statement. In the case of Pakistan Navy this should be prepared in respect of all systems irrespective of the dollar or rupees (Pakistani currency) threshold. The purpose of the operational requirement statement will be to identify the mission area. Since the Pakistan Navy cannot afford the cost of research and development the statement must recommend various systems, which are currently being used by various operational navies of the world, which can fulfill the requirements of the Pakistan Navy. It should also indicate the performance floor below which the system would not be acceptable/feasible. The operational requirement statement should be submitted to the Chief of Naval Staff for decision. With the decision of the Chief of Naval Staff program manager/program liaison officer should be appointed who should have a appropriate staff. The appointment of program manager/program liaison officer will depend upon the size of the program and amount of resources required. They can be placed under the functional control of the Directorate of Projects for looking after the project issues. At the outset of the program, full staff may not be needed but as the program advances and the requirement for an independent staff exists, the requirement should be met. With the approval of the need and establishment of program manager/ program liaison officer phase 1 of the acquisition process is completed.

C. APPROVAL PROCESS WITH THE GOVERNMENT

Once the need for the system has been established it is necessary to obtain approval from the government which is phase 2 of the process. The newly established program

office with a program manager/program liaison officer, as the case may be, will prepare the case for obtaining government approval. Amongst the various duties of the program manager/program liaison officer the most important would be to prepare the acquisition strategy. The acquisition strategy has already been described at great length in Chapter IV section C(1) and it would be duplication of effort to go over it again. However, it may be mentioned that if the program office had to prepare only one document, that document would be the acquisition strategy. During this process presentation by the program manager/program liaison officer be given to the Principal Staff Officers and the Directors at Naval Headquarters. They will also obtain/asses the approximate price/cost of the system as the government would like to know the approximate financial implication involved. After taking into account all the facts a comprehensive case, which includes the mission need/deficiencies in existing capabilities, recommended hardware solution and approximate cost/price, will be forwarded to the Chairman Joint Chiefs of Staff Committee. The Chairman Joint Chiefs of Staff Committee submits the case along with his recommendations to Defense Cabinet Committee (DCC) for its approval. The Defense Cabinet Committee, which is headed by the Prime Minister, after taking into consideration the operational/strategical requirements of all the three services, will approve the acquisition of the system in principle. The approval from the Defense Cabinet Committee for the acquisition of the system is the milestone II of the process and also completes the phase 2.

D. PROCUREMENT PHASE

This is the phase 3 of the acquisition process. In phase 2 of the acquisition process the major emphasis of the program manager were on getting the approval of the

government which is a lengthy and tedious process. This phase which is the most important in the acquisition process requires a very careful and planned effort. Immediately after entering into this phase the program manager has to prepare the source selection plan. The basic purpose of the plan is to decide how the source is going to be selected. What are the basis of selection and what are the most important factors. Because of the peculiar situation in Pakistan Navy, the Directorate General Defense Purchase which is the contracting agency for the major systems contract, being an inter services organization cannot be involved in the source selection process. Therefore a senior officer of the level of principal staff officer may be nominated by the Naval Headquarters for all acquisitions or on a case by case basis. This officer will then assume the duties of the source selection authority. The source selection advisory council can be formed from the various director level officers at the Naval Headquarters. The source selection evaluation boards would be formed up from the staff officers of various directorates. The number of these boards may be formed up depending upon the size and complexity of the system. The boards which would be required are the technical, management, logistic supportability and cost.

Before releasing the request for proposal (RFP) it is necessary to have the approved source selection plan. Public or open tender procedure should be used in getting the proposals and the request for proposal is to be sent to all the potential suppliers and must be given wide publicity. This will provide an opportunity to unlimited numbers of suppliers to submit their proposal. Competition in the defense acquisition is seen as a way to keep the cost down. Therefore competition should be pursued except when it is against the government interests. These exceptions may include following occasions:

1. When there is only one responsible source present.
2. Due to the urgent, unusual or compelling requirement.
3. National security.
4. Public interest.

In the case of acquisition of major systems for the Pakistan Navy the concept of competitive negotiation with slight modification will be used. Before going ahead in utilizing the technique lets see what it is. The general meaning of negotiations may be captured by reference to statements from authoritative sources. For example, Bouvier's Law Dictionary defines negotiations as:

"the deliberation which takes place between parties touching a proposed agreement".

Black's Law Dictionary defines negotiation as:

> deliberation, discussion or conference upon the terms of a proposed agreement; the act of settling or arranging the terms and conditions of a bargain, sale, or other business transaction.

The term negotiation generally implies that a series of offers and counter offers are made in a conference situation continuing until a mutually satisfactory agreement is concluded by the negotiating parties. However, in government procurement in the United States, the term includes solicitation of proposals, conduct of written or oral discussions when required, and making and entering into a contract. Thus competitive negotiations includes a number of events that occur from the issuance of a solicitation until a contract has been established. [Ref. 2:p. 226]

In this process during the course of negotiations the offerers may amend their proposals without invalidating the solicitation or the resulting contract. In order to employ this process, solicitations from all the responsible sources are invited through the request for proposals (RFP). The request for proposals should indicate the matters which are of

significance in gathering competition among suppliers on an equal basis. Some of the important factors are the closing date for receipt of proposals, the factors on which evaluation for source selection will be based, delivery schedules, the proposed type of contract which in case of the Pakistan Navy is firm fixed price type of contract, payment procedure, type of warranty required and appropriate terms and conditions of the contract. In addition the request for proposals clearly states that the contract may be awarded with or without discussion at the discretion of the government.

1. Evaluation

Upon receipt of the proposals from the contractor they are to be evaluated by the source selection evaluation boards. Before the evaluation of the proposals is undertaken the contractors may be allowed to give some presentations/briefings about the proposals highlighting their characteristics and other important issues. After this the proposals are evaluated to form a competitive range. On completion each board will evaluate the proposals in its respective area. The board evaluates these proposals based on the established criteria. The evaluation of the proposals is done on a point system. As far as possible the boards may not be informed of the identities of the contractors to provide for impartial and fair evaluation. The source selection evaluation boards will give their recommendations to source selection advisory council. The source selection advisory council will also carry out comparisons of various proposals which are in the competitive range. The comparisons are necessary to see which contractor provides greater benefits. Some of the benefits/advantages which could be viewed are the training aspects, warranty/guarantee of the equipment, delivery schedule, mode of payment, supply support, technology transfer and of course the price. However care has to be taken in such comparison to avoid comparison of apples with oranges. Source selection advisory council

will then prepare a list of technically acceptable proposals in the ascending/descending order with respect to price. The source selection authority will not approve the source as such but will approve the list of the contractors in the order of precedence. Thus a list of technically acceptable contractors will be approved by the source selection authority. After the list of technically acceptable suppliers/systems has been made the case will be transferred to the Directorate General Defense Purchase for initiating contracting action. On receipt of the case at the Directorate General Defense Purchase it would be studied, evaluated and scrutinized. A negotiating team will be formed up and will prepare their negotiating plan which will be based on their observations during the scrutiny. The contractors are not required to furnish the cost and pricing data in respect of the firm fixed type of contract where the price is based on adequate price competition. However it is a requirement when the price is based on inadequate price competition. In this case the contractor certifies that the cost and pricing data is accurate, complete and current at the time of negotiations.

Once the negotiations have started then it may be difficult to cut it off (end the discussion process). This can be achieved by issuing a notice for cutting off the negotiation by the contracting agency to the contractors with whom negotiations were being conducted. The notice must include advice to the contractors about cut off date and that their best and final offer (BAFO) must be submitted by that time.

At the end of the negotiation/discussions the Directorate General Defense Purchase will select the contractor whose proposal is in the best interest of the government. Also during the negotiations/discussions other contract terms and conditions will be settled. Before contracting with the contractor the case will again be referred to the Prime Minister by the Naval Headquarters with the exact financial implications for his final

approval. After the Prime Minister has accorded the approval, the contract will be concluded with the contractor. With the completion of the contract action phase III of the acquisition process will complete.

E. CONTRACT ADMINISTRATION

Contract administration is an important and integral part of the procurement process as has been shown in Figure 2. The primary purpose of contract administration is to assure that the Government obtains the needed work on time and that the contractor receives proper compensation [Ref. 11:p. 1]. The secondary purpose being to safe guard the public interests. Contract administration begins subsequent to award of contracts and actions to be supported include:

1. Clarifications of intended contractual requirements and quality assurance concerns.
2. Follow-up notifications and inquires to ensure expeditious performance-expediting delivery.
3. Negotiating changes or modification to contracts as required.
4. Performing inspection during performance, if needed.
5. Administration to overcome deficiencies, delays, claims, and related problems arising during performance.
6. Verification of documents associated with payments, and authorization of payment. [Ref. 2:p. 16]

The administration of the contract in ones own country is easier than in a foreign country. Contract administration largely depends upon the type of contract, its technological complexity, duration and magnitude. In foreign procurement contract administration demands a great deal of knowledge of the business, legal and policy differences of every foreign country since each is different and business relationships will have to be tailored to the regulations of the countries involved. In case of the foreign

acquisition the contract administration can be done by either having a program specific memorandum of understanding (MOU) with the government of the contractor which states that the contract administration services will be performed by the contract administration services of that country or a team of personnel may be formed up specifically for that contract. The memorandum of understanding have already been used by various countries for promoting the development of defense equipment and opening of defense markets to competition on a reciprocal basis. Governments are responsible for informing industry of their policies and procedures and industry is responsible for pursuing business opportunities [Ref. 12:p. 2-12]. Memorandum of understanding have their advantages over the team of personnel assigned the job for contract administration. In case of a memoranda of understanding between the two countries, the government of the supplying contractor will carry out the contract administration services. Their personnel may very well be there in the premises of the contractor administrating their own contracts and thus are already aware of the systems of the contractors. It may also be cost effective. The most important advantage of having the contract administration done by the contract administration services of the country is that the contractor will not be able to interpret the things differently. Memorandum of understandings may be drafted and negotiated to meet the specific needs. A third option which is also available is hiring of a consulting firm in the country of origin. The utilization of this option will depend upon the consulting firm, their experience in this field and their charges for the services.

The contract administration is an on going process which continues as the progress is made on the contract. In case of the contract for multiple systems, this phase of the process will be concurrent with next phase i.e., system deployment. For example in case of aircraft, the completed aircraft will be handed over to Pakistan for deployment but the

administration on those aircraft which are under production will continue. Successful contract administration will conclude the phase IV of the process.

F. SYSTEM DEPLOYMENT

This is the phase V and the last phase of the acquisition process. During this phase the emphasis will again be towards the activities in the country i.e.,Pakistan. This phase starts when the system is ready and delivered. The major areas of concern during this phase are to:

1. ensure that adequate training has been provided to the operating and technical personnel.
2. ensure that adequate logistic support capability exists in the country.
3. ensure that there is a full organizational, intermediate and depot level maintenance capability in country.
4. ensure that all the required publications, both technical publications for maintenance and non technical publications for operation purposes have been received in the required language.
5. ensure that all the personnel (users, maintainers and providers) are aware of the existence of warranty, if any. This is necessary to have the component/assembly repaired or replaced by the contractor as the case may be.

As has been described in phase IV of the process that in certain cases there will be concurrency between phase IV and phase V. In such cases when a system is received and deployed,its performance should be evaluated. With the systems delivery and deployment in the country the acquisition process completes.

G. OTHER ISSUES

1. Warranty

In major systems warranty is an obligation of the contractor under-taken through a fixed price type contract to repair or replace equipment found to be defective

during the period of warranty coverage. The warranties are protection against patent defects. The reason for including such a clause in the contract is to overcome the finality of acceptance. The purpose of major systems warranty is to have a reliable system and to improve the probability that the system will perform at a specified, acceptable level when it is needed. The factors of consideration in major systems warranties are:

1. functional performance, the system does what it is supposed to do.
2. availability, the overall reliability and maintainability of the system. It is usually expressed as a probability or a percentage.
3. cost, is it affordable or not.

Whenever a system is warranted, the contractor gets paid for that and how much do we pay for this is difficult to ascertain. Similarly it is difficult to decide its duration. The most important factor in the warranty is its administration. It is difficult to keep track of all the warranted equipments, level of warranty, period of warranty. All the personnel who are handling equipment will have to be informed of the warranty and trained in warranty administration. Records of all the warranted equipments/systems will have to be maintained. If the equipment breaks and the contractor honors his warranty and repairs/replaces that equipment, whether or not the repaired/replaced equipment is under warranty and until what time is yet another issue.

Warranty disputes may frequently arise due to many reasons. The significant ones could be mishandling, damage while in transit, questions involving warranty, terminations and envoirnmental stresses which exceed anticipated levels. The problem of disputes cannot be eliminated but can be minimized by making the warranty clause precise and clear.

Although warranties can be effectively used on firm fix type of contracts, the following factors must be used before deciding to use it. [Ref. 13:p. 2-24]

1. Nature of the item and its end use.
2. Cost of the warranty and degree of price competition as it may affect this price.
3. Criticality of achieving specified performance capabilities and design specifications.
4. Cost of correction or replacement, either by the contractor or another source, in the absence of a warranty.
5. Administrative cost and difficulty of enforcing the warranty.
6. Ability to take advantage of warranty, considering storage times, distance from source, and other factors.
7. Whether or not the item is customarily warranted in the trade.

The bottom line of warranty is to have a system which works when needed, does what it is required to do and performs what it is intended to. If we achieved this we have achieved our goal.

The advantages and disadvantages of warranty are contained in Appendix C.

2. Currency, Payment and Related Issues

It is important to address currency of which country will be used, currency exchange timings, currency rate determination base and currency fluctuation risk sharing. Also the procedure of payment is to be agreed upon and reduced to writing.

3. Legal Considerations

During the contract negotiations it must be established which country's laws will be used. This fact must be recorded in the contract also. In addition foreign purchases almost always involve transportation by ship which involves an entire additional set of laws known as admiralty law, which is normally not a consideration in domestic purchasing [Ref. 9:p. 135].

4. Contract Responsibilities

Other important factors which must be addressed in the contract are the duties and responsibilities of both parties of the contract. What course of action is to be taken in case any one defaults in his area of responsibility. Similarly other issues such as termination of contract, insurance during transit, freight charges and changes made during production are some of the areas which must also be addressed in the contract.

VI. CONCLUSION AND RECOMMENDATIONS

A. CONCLUSION

The acquisition of a major system is a complex and lengthy process and therefore requires special management skills. In any major system acquisition there are countless tasks and functions that must be performed properly. The amount and type of the work involved is an indication of the magnitude and complexity of the task to be accomplished. If the entire process is taken as one issue without dividing it into phases, it will be difficult to control and monitor the process. The process which has been recommended incorporates the concept of life cycle, has a distinct structure of phases and major decision points which provides the opportunity to control and assess the acquisition strategy during each phase of the acquisition. It has also been recommended for having a strong central management in respect of each and every individual major system acquisition. Thus management will be able to integrate all the necessary activities to carry them out smoothly under the direction of a single manager with decision authority.

There is a requirement of continuous evaluation and improvement in the major systems acquisition process. The process described in this thesis is capable of handling the complex systems and is a step forward towards the improvement of the systems acquisition process in the Pakistan Navy. The foreseeable improvements which can be achieved are:

1. Enhance the ability of the process to get effective weapon system into the service as they are needed.
2. To ensure that acquisition is economically efficient.

B. RECOMMENDATIONS

As a result of this research, it is recommended that following activities/actions be incorporated or modified.

1. System Acquisition Process

The existing procedure of doing the activities may be modified to the process which utilizes the concept of phases and milestones. Implementation of this process will simplify and improve the control on the activities.

2. Program Manager/Program Liaison Officer

A program manager/program liaison officer be appointed depending upon the size and complexity of the program at the milestone 1 decision point. He should take over all the tasks of that particular program. The program manager be given wide scope of authority and responsibility. This will emphasize the central management concept and will obviate the necessity of referring the matters to various authorities for decision.

3. Documentation

Following documentation must be prepared at the times mentioned for each.

a. Acquisition Strategy

Acquisition strategy describes the program and how the acquisition is going to be accomplished on over all basis. It should be written by the program manager in the phase 2 of the process.

b. Source Selection Plan

Source selection plan which describes how the source selection is to be conducted should be prepared before releasing the request for proposal (RFP) in the phase 3 of the process.

4. Contract Administration

Contract administration being the integral part of the procurement process must be carried out. The details of how this task can be accomplished has been provided in Chapter V(E).

5. Further Research

The process described in this thesis is the broad method of doing the major system acquisition. Once this process is adapted, it will be necessary to have other details such as the competition, source selection plan, acquisition strategy worked out. It is therefore recommended that further research in this field may be directed towards it.

Appendix A

THE MISSION NEED STATEMENT (MNS)

The mission need statement is required when the acquisition of the program will meet the dollar threshold criteria ($ 200 million for research and development contracts or $ 1 billion in case of procurement contract in 1980 constant dollar). It is limited to three pages and is submitted to the Defense Acquisition Executive. The Mission Need Statement is prepared from the results of the mission area analysis. Mission Need Statement is prepared by the service prior to milestone 0 decision which accomplishes:

1. Identifies the mission area. The program objectives and needs are expressed in mission terms and not equipment terms to encourage innovation and competition in creating, exploring, and developing alternative design concepts.

2. Describe the known alternative concepts in which will be considered during the concept exploration/definition phase.

3. Indicate whether or not similar program is under development by an allied nation and if yes what are the implications of cooperative development of that program.

4. Identify the technology involved and its known limits.

5. Identify the existing capabilities to accomplish the mission.

6. Identify the initial acquisition strategy (competition, sole source etc.).

7. Discuses funding implications i.e. whether the system is affordable or not. The funds available for the program and whether it can be fully funded.

8. Indicate the performance floor below which the system would not be acceptable and other key boundaries for satisfying the needs.

9. Provide a summary of the plan of various activities to be done in the process such as competition, contracting approach and acquisition streamlining.

Appendix B

KEY PERSONNEL IN THE PROGRAM OFFICE

The following are the key personnel in the program office.

1. The Program Manager is usually a military officer, but he/she can be a civilian, with past experience with the system. He/she is the key advocate of the program. Important skills which are required are:

   Should be a generalists and not bogged up in the details. Should keep in mind the big picture.
   He/she should be a leader and be able to deal with all levels, senior/junior, external/internal to the command.
   Should be able to deal with military and civilian.
   He/she should be persuasive in dealing with seniors, military and civilian personnel.

2. The deputy program manager is normally optional but is good from the continuity point of view.

3. The business financial manager monitors the funds and all the key reports regarding the program.

4. The system engineer oversees the design of the system and specification development.

5. The logistics manager coordinates the decisions concerning the maintenance cycles.

6. The production manager monitors the system in the production stage.

7. Configuration manager manages the specification changes ensuring proper documentation.

APPENDIX C

ADVANTAGES AND DISADVANTAGES OF WARRANTY

Following are the advantages of warranty:

1. With the inclusion of a warranty for the system the interest of the contractor can be retained in the equipments life cycle cost. Since the seller is in contact with his equipment he can evaluate, document and improve the current or future performance of the system.

2. When the contractor knows that he will be held responsible for the performance of the system he will try and improve the design of the system and also review the contract specification attentively. All of this will ultimately improve the quality of the system.

3. If the system is warranted the Government does not have to stock the support spares. This is a large savings as a lot of effort and resources are required to be put in for the procurement, accounting, issue and replenishment of inventory.

4. No training costs of the technicians are involved.

5. Even if the training is given by the Government, the trained technicians are going to take some time to know the equipment and are bound to take greater time in trouble shooting than the contractor who has made the system.

6. Costs of the test equipment and special tooling are avoided.

7. Reduces the number of field technicians.

8. The reliability and performance of the system is increased.

9. The warranty improves the quality and quality directly effects the ability of the defense forces to win in war.

Following are the disadvantages of warranty:

1. The Government heavily depends upon the contractor for the maintenance of system. Once the warranty period expires either the Government will hire the services of the contractor on exorbitant charges or will have to bring on line its own maintenance staff which at that later stage could be difficult and expensive.

2. The systems warranted are to be managed properly. All the personnel involved specifically the end users must know which systems/components are warranted and what procedures are to be used for using the warranty clause.

3. The warranted systems/equipment may require certain maintenance routines. Non performance on these can invalidate the warranty clause.

4. At times warranty of a system/equipment expires when the item is not even opened or used.

5. In case of repair on the warranted system/equipment the repair turn around time is more, as the thing has to be disassembled and sent to the manufacturer who may not work immediately on it and then it must ship back to user and reinstalled.

6. If the warranted item fails out in the field or at sea and is opened to check if it could be repaired, the warranty will not be honored by the contractor.

7. Often the end user does not know which things are on warranty or the period of warranty.

8. The cost of the weapon systems will increase as it is difficult for the contractor to price the risk due to competitive pressures, optimistic reliability and maintainability etc.

9. The difficulties in maintaining the records of the warranted equipment creates problem in its enforcement.

LIST OF REFERENCES

1. U.S. Department of Defense and National Security Industrial Association, Proceedings of Symposium on Major Defense Systems Acquisition, Government Printing Office, Washington, DC, 1971.

2. Stanley N. Sherman, Government Procurement Management, 2d. ed.,Wordcrafters Publication, 1985.

3. U.S. Department of Defense Directive Number 5000.1, September 1, 1987.

4. U.S. Department of Defense Instruction Number 5000.2, September 1, 1987.

5. U.S. Office of Management and Budget, Washington, DC, Circular Number A-109, April 5, 1976.

6. James Brian Quinn, Henry Mintzberg, Robert M. James, The Strategy Process, Prentice Hall, 1988.

7. Defense Management College, Acquisition Strategy Guide, First edition, July 1984.

8. Defense Systems Management College, Joint Logistics Commanders Guide for the Management of Multinational Programs, July 1981.

9. Donald W. Dobler, Lamar Lee, Jr., and David N. Burt, Purchasing and Materials Management, 4th. ed., McGraw-Hill Book Company, 1984.

10. William G. Sveltich, The Systems Acquisition Process and its Limitations in the Department of Defense, National Defense University Washington, DC, 1979.

11. John Cibinic, Jr., Ralph C. Nash, Jr., Administration of Government Contracts, 2d. ed., The George Washington University, 1986.

12. Defense Systems Management College, Guide for the Management of Multinational Programs, 2d. ed., 1987.

13. U.S. Department of Defense, Defense Cost and Price Analysis, 1985.

INITIAL DISTRIBUTION LIST

		No. of Copies
1.	Defense Technical Information Center Cameron Station Alexandria, VA 22304-6145	2
2.	Library, Code 0142 Naval Postgraduate School Monterey, CA 93943-5000	2
3.	Prof. Raymond W. Smith, Code 54 SX Department of Administrative Science Naval Postgraduate School Monterey, CA 93943	1
4.	Prof. Paul M. Carrick, Code 54 CA Department of Administrative Science Naval Postgraduate School Monterey, CA 93943	1
5.	Prof. David V. Lamm, Code 54 LT Department of Administrative Science Naval Postgraduate School Monterey, CA 93943	2
6.	Deputy Chief of Naval Staff (Supply Services) Naval Headquarters, Islamabad Pakistan	1
7.	Director of Projects Naval Headquarters Islamabad Pakistan	1
8.	Director Naval Stores Naval Headquarters Islamabad Pakistan	1

9. Director Procurement Navy — 1
C/O Fleet Mail Office
PN Dockyard
Karachi
Pakistan

10. Officer in Charge — 2
S and S School
C/O Fleet Mail Office
PN Dockyard
Karachi
Pakistan

11. Lieut. Commander Waqar Siddiq — 2
177 Block 2
P.E.C.H.Society
Karachi
Pakistan